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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/921,286	08/02/2001	Wolfgang Buerger	GT/83A	5322

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Allan M. Wheatcraft
W.L. Gore & Associates, Inc.
551 Paper Mill Road
P.O. Box 9206
Newark, DE 19714-9206

EXAMINER

RUTHKOSKY, MARK

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/921,286

Applicant(s)

BUERGER ET AL.

Examiner

Mark Ruthkosky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burger et al. (WO 99/16138) in view of Oka et al. (US 5,830,603.)

The instant claims are to an electrochemical energy storage device comprising at least two electrodes and a KOH electrolyte, and a carrier material for the electrolyte disposed between the electrodes. The carrier material comprises a porous material having inner pores in which a perfluorinated polyether phosphate is present.

Burger et al. (WO 99/16138) teaches an electrochemical energy storage device comprising at least two electrodes and an electrolyte, and a carrier material for the electrolyte disposed between the electrodes (see claims 1-21.) The carrier material comprises a porous material having inner pores in which a perfluorinated-polyether phosphate is present (see page 14, and Table 1, MF 201 for a perfluorinated-polyether phosphate.) The porous material is shown to be PTFE. Nanoscale ceramics, including phosphates, are noted in the last paragraph of page 12. The device is disclosed to be a capacitor and may have a base as the electrolyte (page 2, lines 3-10 and page 4, line 29-page 5 end.)

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Burger et al. (WO 99/16138) teaches base electrolytes, but does not teach the base electrolyte to be KOH. Oka et al. (US 5,830,603) teaches an electrochemical energy storage device comprising at least two electrodes and an electrolyte, and a carrier material for the electrolyte disposed between the electrodes (see claims 1-27.) The carrier material comprises a porous material, such as PTFE, having inner pores that are imbibed with a hydrophilic resin (see col. 6, lines 42-64; col. 7, lines 25-45; col. 10, lines 15-35.) Nafion, which is a perfluorinated-polyether, is noted as a resin added to the pores of the carrier matrix (col. 7, line 41.) The reference further teaches that the electrolyte matrix is used in alkaline storage batteries (col. 12, lines 30-35; col. 10, lines 15-35), has excellent stability against alkali, and shows specific examples of the composite carrier used in an alkaline battery with KOH as an electrolyte (such as in example 1.)

It would be obvious to one of ordinary skill in the art at the time the invention was made to use KOH as the base electrolyte of Burger et al. (WO 99/16138) as it is broadly known as a base electrolyte in electrochemical devices in order to transfer electrochemical charge. As Burger et al. (WO 99/16138) teaches the device to have a base electrolyte, one of ordinary skill would understand that KOH would be a useful base electrolyte to transfer charge. Further, one of ordinary skill in the art would recognize from the teachings of Oka et al. (US 5,830,603) that the electrolyte would transfer charge in a composite matrix of PTFE with a hydrophilic material such as a perfluorinated-polyether phosphate.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burger et al. (WO 99/16138) in view of Oka et al. (US 5,830,603) as previously applied, and further in view of Hiroshi (EP 718,903.)

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The teachings of Burger et al. (WP 99/16138) and Oka et al. (US 5,830,603) have been presented. Burger et al. (WP 99/16138) and Oka et al. (US 5,830,603) do not teach the electrochemical devices to be an alkaline fuel cell. The Burger reference does note that the electrolyte/separator could be used in a fuel cell and that the material is commonly used with a base electrolyte. Hiroshi (EP 718,903), however, teaches a fuel cell incorporating a membrane in which a porous membrane material is coated with a resin that may include sulfonic acid functional groups (see the examples.) The membrane is used between two electrodes to transfer charges as in the instant application. It would be obvious to one of ordinary skill in the art at the time the invention was made to use the membrane of Burger et al. (WP 99/16138) in an electrical device such as an alkaline fuel cell as one of ordinary skill in the art would recognize that the material may be applied to transfer ionic charge between the electrodes of a fuel cell as taught in both Burger and Hiroshi (EP 718,903.) As the Burger et al. (WO 99/16138) reference teaches the membrane may be used in a variety of electrochemical energy storage devices, one of ordinary skill would expect ionic transfer using the membrane in a fuel cell.

Response to Arguments

Applicant's arguments filed 8/02/2004 have been fully considered but they are not persuasive. The applicant argues that instant invention is patentable over the teachings of the applied references, Burger et al. (WO 99/16138) in view of Oka et al. (US 5,830,603), because the instant invention produces surprising results, which renders the combination of the references nonobvious. The applicant makes reference to "F10 (FLUOROLINK, as noted on page 9 of the instant specification), a preferred perfluoro-polyether phosphate of the present invention" and

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suggests that it is surprising that this material functions as a wetting agent for KOH. The applicant further notes that the product literature for the perfluorinated polyether phosphate material promotes its use as a barrier layer for oil/water repellency. The applicant concludes that it is unexpected that the material actually facilitates penetration of KOH (aqueous) into ePTFE because the material is expected to repel water.

Based on the record as a whole, the arguments are not found persuasive. First, the claimed subject matter is to an inner pore structure with a perfluorinated-polyether phosphate present. Thus, the claim is not limited to an inner pore structure with the structure of F10 present. Second, the result that the perfluorinated polyether phosphate material facilitates penetration of KOH (aqueous) into the electrolyte is not unexpected. Burger teaches an electrolyte carrier material comprising a porous material having inner pores with a perfluorinated-polyether phosphate present. Page two of the Burger reference states:

15 The presence of a perfluorinated surface-active substance in the inner pore structure of the porous fluoropolymer makes the latter wettable and receptive for the electrolyte. This wettability ensures a sufficient hold of the electrolyte in the carrier material, in particular in the pores. A sufficient presence of electrolyte in the pores permits the ions to penetrate through the electrolyte-filled pores of the carrier material and thus high ion flow and high ion mobility, leading to low ohmic resistance of the storage means. Chemical and thermal stability of the modified porous material and stable
20 adhesion of the substance to the porous material ensure a long life of the inventive storage means.

Page 15 of the Burger reference states that the electrolyte may be an aqueous salt solution, aqueous solution of organic or inorganic acids or bases (line 30.) From this teaching, it is shown that the addition of the perfluorinated polyether phosphate material will facilitate aqueous solutions, including base solutions into the ePTFE. The supporting reference is used to show that KOH is commonly used to transfer ions in electrochemical systems.

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The product reference does not clearly define a specific structure. It noted that the FLUOROLINK trade material may be modified to be in acidic or salt forms. It states that that it can be water-based which shows that it may be hydrophilic as it is dissolved by water.

In addition, Burger et al. (WO 99/16138) clearly states that the materials are added to the substrate to improve electrolytic flow, ion flow and mobility (page 6.) From the applied teachings, it would be obvious to use KOH as a base electrolyte in the invention of Burger as the material will improve the conductivity of the electrolyte through the porous PTFE composite membrane.

Conclusion

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to the entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark Ruthkosky

Primary Patent Examiner

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Mark Ruthkosky
10/28/04